

REMARKS

I. Status of the Claims:

Claims 1-27 and new claim 28 remain in the case. None of the changes is believed to introduce new matter. Entry and consideration of this Amendment are respectfully requested.

II. Objections

The title is objected to, the Examiner requiring a title with more explicit language that conveys the main idea of the claimed invention.

Accordingly, the title has been amended to now read: "A SYMBOL INTERLEAVER SELECTED FROM A SET OF SYMBOL INTERLEAVERS."

II. Rejections

Claim 18 is rejected under 35 U.S.C. 112, second paragraph, for an incorrect dependency. The above amendment corrects claim 18 to depend on claim 17.

Claims 1-16, 19, and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroaki JP 2001-060934 (Hiroaki) in view of Applicant's Admitted Prior Art.

Claims 17-18 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroaki JP 2001-060934 (Hiroaki) in view of Applicant's Admitted Prior Art, and further in view of ETSI EN 300 744 V1.4.1 (20001-01).

III. Applicant's Response

The Applicant's claimed invention selects an appropriate symbol interleaver to obtain a desired depth of interleaving. The Applicant's amended claim 1 reads: "selecting the symbol interleaver is based on a desired depth of interleaving". The Applicant's claimed invention enables selecting the depth in symbol interleaving by selecting the symbol interleaver. This is

discussed, for example, in the Applicant's specification paragraphs [0065] and [0066], which read as follows:

[0065] The lower part of FIG. 3 shows an exemplary interleaving result. It can be seen that the interleaving depth of the symbol interleaving according to the first preferred embodiment is two (4K mode) OFDM-symbols since data words that would fit into one 4K mode OFDM-symbol are interleaved in the area of two (4K mode) OFDM-symbols. Accordingly, when using 8K mode symbol interleaver (whose block size 6048 is twice the number of data words that fit into one 4K mode OFDM-symbol) in 4K mode, inter-symbol interleaving is done between data words belonging to two adjacent 4K mode OFDM-symbols.

[0066] The fact that the symbol interleaving covers more than one OFDM-symbol improves the system's capability to cope with impulse like interference and sudden changes (dynamics) on channels. Also, the use of the existing 8K mode symbol interleaver in 4K mode dispenses with the need to define a new symbol interleaver for 4K mode. This will save space both in the DVB-T transmitter and especially in a plurality of DVB-T receivers since no new circuitry is needed for an extra interleaver (or de-interleaver).

By contrast, the Hiroaki reference JP 2001-060934 (Hiroaki) only relates to re-transmissions and does not present any selection between different depths of interleaving. Paragraph [35], which the Examiner refers to, only discloses that the interleave processing sections 102 and 103 can contain various interleavers, from which a symbol interleaver and a chip interleaver are presented as examples.

The Hiroaki reference does not disclose or suggest selecting an appropriate symbol interleaver to obtain desired depth of interleaving, as claimed by the Applicant. The Applicant's amended claim 1 reads: "selecting the symbol interleaver is based on a desired depth of interleaving".

The Examiner refers to "Applicant's Admitted Prior Art", which the Examiner explains on page 4 of the Office action as the Applicant's specification, paragraphs 2 and 6. Paragraph 2 merely discusses DVB-T broadcasting systems, which transmit TV shows to a plurality of

conventional TV receivers. Paragraph 6 merely discusses DVB-T broadcasting systems having a predetermined number of active carriers (i.e. TV channels) for transmission to a plurality of conventional TV receivers.

The DVB-T broadcasting systems do not disclose or suggest selecting an appropriate symbol interleaver to obtain desired depth of interleaving, as claimed by the Applicant. The Applicant's amended claim 1 reads: "selecting the symbol interleaver is based on a desired depth of interleaving".

The ETSI EN 300 744 V1.4.1 (20001-01) reference is the European Telecommunications Standardization Institute's standard for Digital Video Broadcasting (DVB): Framing structure, channel coding and modulation for digital terrestrial television. Pages 30-32, Table 9 and 15 referred to by the Examiner describe transmission parameter signaling.

The ETSI reference does not disclose or suggest selecting an appropriate symbol interleaver to obtain desired depth of interleaving, as claimed by the Applicant. The Applicant's amended claim 1 reads: "selecting the symbol interleaver is based on a desired depth of interleaving".

In the cited references, the size of the symbol interleaver and the size of the symbol to be interleaved are the same. This means that, for example, an 8K interleaver is used in an 8K operating mode, and a 2K interleaver is used in a 2K operating mode. However, when the system operates in 4K or 2K modes, the symbol interleaving depth is sometimes too small.

The solution presented in the Applicant's claimed invention enables selecting a symbol interleaver which was originally designed for a certain mode, to be used in another mode. In the Applicant's claimed invention, the 8K symbol interleaver can be used, for example, in 2K mode, wherein the interleaving depth becomes greater. This is due to the fact that the amount of data to be interleaved at a time (i.e., the block size) in 8K mode is greater than that in 2K mode. When 8K symbol interleaver is used in 2K mode, this means that interleaving is performed over four 2K symbols instead of one 2K symbol. This is in contrast to prior art solutions in which the 2K operating mode always used the 2K symbol interleaver. None of the cited references discloses or

suggests selecting a symbol interleaver from a set of symbol interleavers, as claimed by the Applicant.

Moreover, none of the cited references discloses or suggests selecting an appropriate symbol interleaver to obtain desired depth of interleaving. The Applicant's claimed invention enables selecting the depth in symbol interleaving by selecting the symbol interleaver. This is in contrast to the disclosures of all cited references. There is no capability in the cited references to select the interleaving depth by means of selecting the symbol interleaver.

The combination of Hiroaki JP 2001-060934 (Hiroaki) in view of Applicant's Admitted Prior Art, and further in view of ETSI EN 300 744 V1.4.1 (20001-01) do not disclose or suggest selecting an appropriate symbol interleaver to obtain desired depth of interleaving, as claimed by the Applicant. The individual references have no such disclosure or suggestion and thus their combination must equally fail.

The Applicant's claimed invention is patentable over the cited references taken singly or in combination.

CONCLUSION

Based on the foregoing amendments and remarks, Applicants respectfully request reconsideration and withdrawal of the rejection of claims and allowance of this application.

AUTHORIZATION

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. 13-4500, Order No. 4208-4234.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is

hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No 13-4500, Order No. 4208-4234.

Respectfully submitted,
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Dated: November 20, 2007

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